COTTON'S INCREDIBLE JOURNEY

Overview

Through this lesson plan on cotton's journey, students have an opportunity to look at the life of cotton from seed to the finished product. They will also learn about the history and get involved in hands on activities related to cotton.

Suggested Grade Level:
4th-5th

Time:
1 hour and 15 minutes

Subjects:
Science
Social Studies
Language Arts

Objectives

1. Students will learn the sequence of cotton production and what each step entails.
2. Students will be able to identify the different parts of a cotton plant.

Background Information

Cotton has been in existence for over 7,000 years. In 1794 the cotton gin was patented by Eli Whitney and was a major contribution to the cotton industry. Cottons main purpose is in the making of fabric. It is the most common natural textile used today and is the most important material used to make fabric. Not only is cotton used in fabric, the cottonseed oil is used in cooking products such as cooking oil and salad dressing. Today, approximately 9.6 million pounds of cotton are used in the United States each year. The leading producers of cotton in the world include China, the United States, India and Pakistan.

Kansas Cotton Production

Most of the cotton varieties grown in Kansas are upland cotton and used as a source of fiber for denim. In Kansas, cotton is planted in May or early June and reaches maturity in approximately 120 days. Unlike many Kansas crops, cotton may be left standing in the field for weeks without being damaged before it is harvested. The cotton gin locations in Kansas include; Pratt, Moscow, Anthony and Winfield.

Uses of Cottonseed

Cottonseed Linters: Essential components in plastics, smokeless gunpowder, food casings, rayon, cosmetics and photographic films. Absorbent cotton medical grade fibers are used in paper and cotton swabs, balls and gauze; and fiber pulp is used in producing currency and other security papers.

Cottonseed Burrs: Used for livestock feed, mulch and soil conditioners.

Cottonseed Kernels: Cotton meal and cake from kernels is used for home garden fertilizers, livestock and poultry feed, fish feed and bait; crude oil is either refined for salad/cooking and baking/frying oils or used to manufacture items as diverse as explosives, pharmaceuticals, fungicides and rubber.

COTTON'S INCREDIBLE JOURNEY

History of Cotton's Incredible Journey

12,000 B.C.
Cotton cloth was used to wrap mummies in Egypt.

3,000 B.C.
Archaeologists found cloth fragments, proof that cotton was being grown in the Indus Valley of India.

800 A.D.
Arab merchants brought cotton cloth to Europe

1492
Columbus came to America and found cotton growing in the Bahamian Islands.

1500
Cotton was generally known throughout the world.

1616
American colonists were growing cotton along the James River in Virginia.

1793
Eli Whitney invented the cotton gin which revolutionized the cotton industry.

1849
Denim jeans were created for miners during the California Gold Rush.

1850
First cotton picking device was patented.

1860
America's cotton crop reached almost a million pounds which was 2/3 of the world's supply.

1879
Thomas Edison manufactured the light bulb using cotton filament.

1892
The boll weevil (beetle that feeds on cotton buds, blooms and bolls) migrated from Mexico through Texas and spread rapidly through the cotton belt.

1905
Wilbur and Orville Wright covered the wings of their first airplane with cotton.

1914
World War I broke out and fine cotton fibers were used to make a smoke-less gun powder.

1969
Astronauts returning from the mood wear all cotton isolation suits.

1982
Over 38 thousand farms in the U.S. are growing cotton. There farms produced 5,742,240,000 pounds of cotton.

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Vocabulary

Bale: A bundle of cotton fiber, tightly compressed and secured with steel wires or nylon straps.

Boll: The rounded capsule of the cotton plant that surrounds the seeds and the fibers attached to the seeds.

Boll Buggy: Designed to move and dump cotton from the field into the module builder.

Bolt: A large roll of cloth of a definite length.

Cottonseed: The seed of the cotton plant and the source of cottonseed oil.

Cotton Gin: A machine that quickly and easily separates cotton fibers from their seeds.

Cotton Module: Stores raw cotton after harvest to protect against weather until the cotton is ginned.

Cottonseed Meal: The residue of cottonseed kernels from which oil has been extracted, used as fodder or fertilizer.

Dye: A natural substance used to add a color to or change the color of something.

Fiber: Long strands of molecules interwoven to form a linear, string-like structure

Hulls: The outer covering of the cottonseed.

Lint: Long cotton fiber (1 to 1.75 inches long) that are cleaned, straightened, and spun into thread or yarn.

Linters: The short fibers (fuzz) attached to the cottonseed; used in a wide variety of consumer and industrial products. Some of these products include; yarns, felts, paper goods, medical grade cotton and food casings.

Spinning: To make yarn by drawing out, twisting and winding fibers.

Stripper Harvester: A machine that harvests by stripping the entire plant of both open and unopened bolls along with leaves and stems.

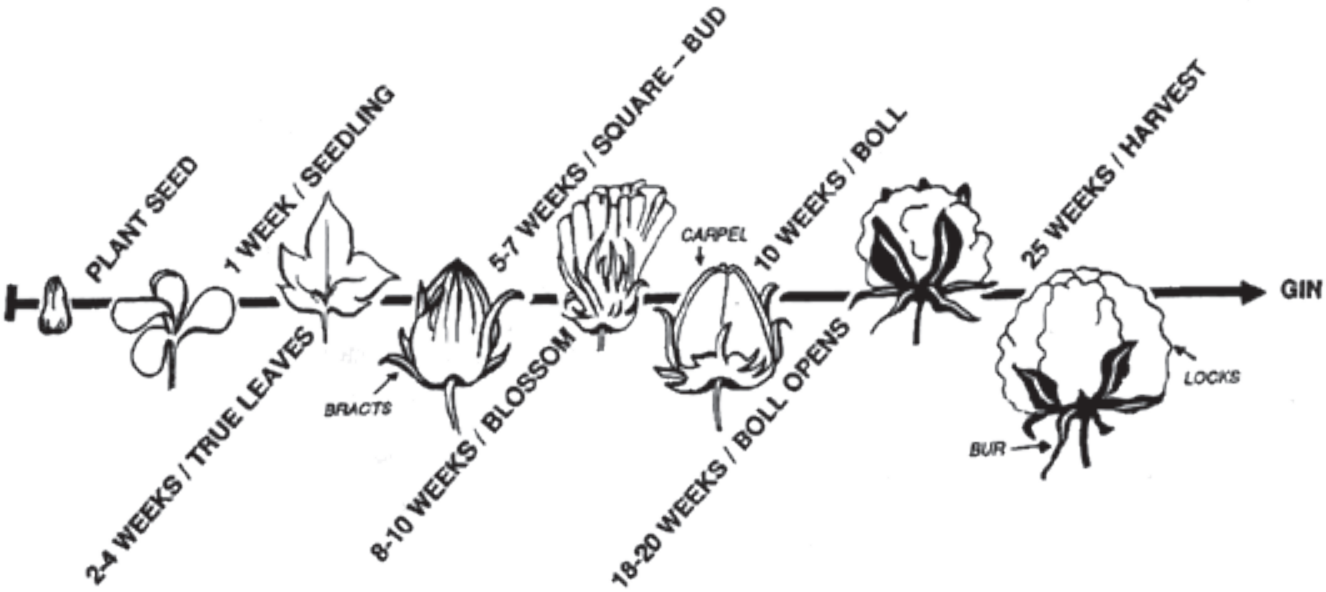
Weave: To interlace threads, yarns, strips, fibrous material, etc. to form a fabric or material.

Yarn: A long continuous length of interlocked fibers.

COTTON'S INCREDIBLE JOURNEY

Life Cycle of Cotton and Plant Parts

Boll: Seed bearing capsule of the cotton plant that contains about 32 seeds that begins to produce lint or fiber.
Cottonseed: Seed from which the fibers grow and produces products such as oil, meal and hulls.
Flower: Cotton flowers are perfect flowers (flowers that contain both male and female reproductive parts).
Leaves: Cotton plants have broad three-lobed leaves.
Lint: Downy fiber that is white or cream in color and is used in the spinning process.



Source: http://www.cottonsjourney.com/Storyofcotton/page3.asp

COTTON'S INCREDIBLE JOURNEY

Lesson 1

Materials

- Cotton balls
- Small paper plates (one per student)
- Hole punch
- Scissors
- Yarn
- Glue
- Crayons or map colors

Procedures

1. Using the pattern have the students color each part of the cotton plant or use construction paper to create:
   - seed: brown, red or purple
   - leaf: green
   - first flower: white
   - second flower is pollinated: pink
   - new boll: green
   - 4 burrs: brown
2. Cut out each picture.
3. Have the students write in their own words on the back of the picture what it represents.
   Example:
   Seed: Cottonseeds are planted into the ground
   Leaf: After the seed has sprouted, leaves begin to grow
   White Flower: Next, the plant begins to make white flowers
   Pink Flower: Once pollinated, the white flowers turns to pink
   New boll: When the flower falls off a bud forms
   Boll (paper plate): The bud grows into a new boll, and the boll opens once the plant has died
   Inside the boll is the fluffy white cotton fiber
4. Students separate cotton balls to form the four sections of a cotton boll and glue them onto the back of the paper plate.
5. Students then take the four brown pieces of paper that represented burrs and glue each of the pieces onto the plate to separate each section of the boll.
6. Punch a hole in the bottom of the plate and the top of the seed (the boll and seed will only have one hole).
7. The students take the remaining four parts of the plant and punch a hole in the top and bottom of the paper.
8. Have them cut out a piece of yarn about 2 feet long and take one of the tips of yarn and tie or staple it to the plate.
9. Next weave the yarn in and out of the holes on the other five pieces until all of the pieces are attached in sequence.

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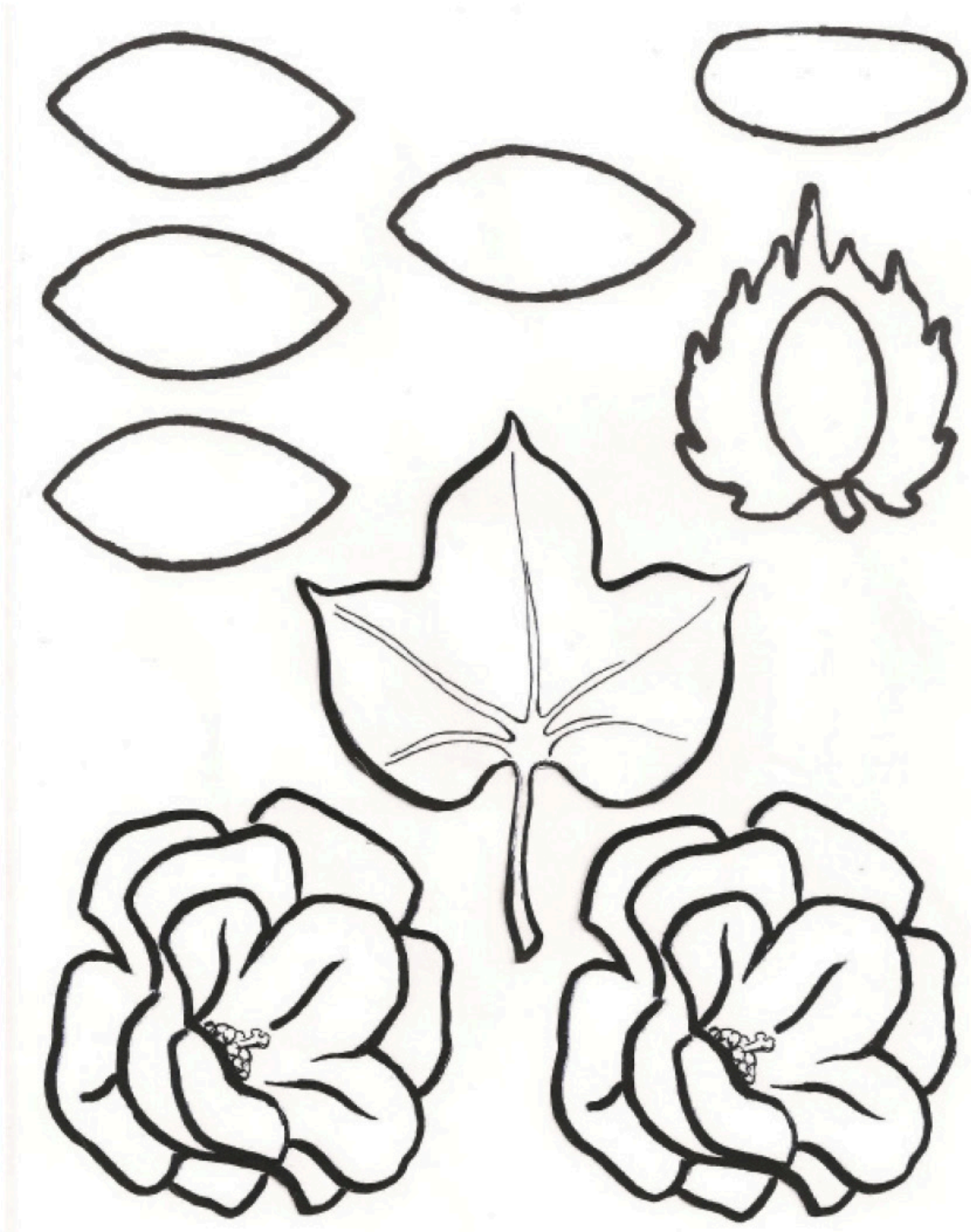

COTTON'S INCREDIBLE JOURNEY

Kansas Cotton Harvest

1. Stripper Harvester

2. Dumping Cotton into Boll Buggy

3. Boll Buggy to Module Builder

4. Building a Cotton Module

5. New Cotton Module

6. Tarped Cotton Module

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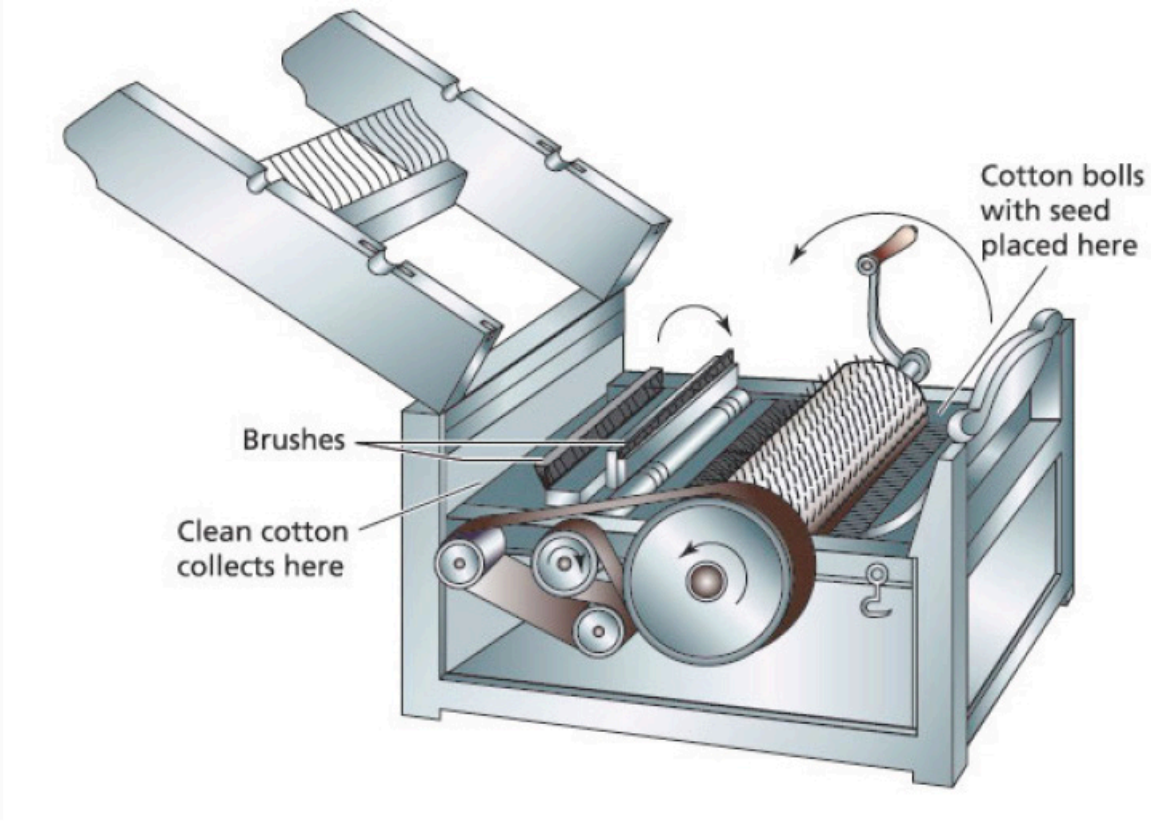
COTTON'S INCREDIBLE JOURNEY

Lesson 2 - Who Really Invented the Cotton Gin?



Cotton Gin Facts

The cotton gin was first invented by Eli Whitney in 1793. Or was it?

Eli Whitney obtained a patent for his cotton gin in 1794.

This machine essentially cleans raw cotton and prepares the fiber for spinning and weaving.

The cotton gin revolutionized the cotton industry and increased demand.

The work of approximately one hundred men was replaced with the invention of this cotton gin.

About fifty-five pounds of cleaned cotton was produced in a day by Eli's cotton gin.

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Procedures

There is some debate on who really invented the cotton gin. Research the following groups with keywords who invented the cotton gin?

1. Divide the class in five different groups that were important to cotton production in the south:

• Eli Whitney

• Catherine Littlefield Greene

• Sam: (African slave)

• Southern planters

• Patent Examiner

• Noah Homes

2. Have the groups research the development of the cotton gin for a role-play activity. Have them explain their assigned inventor development process of the cotton gin including the location the machine was designed, year it was claimed by inventor, materials used, and the basic mechanics of the machine.

3. Discuss each of the first four groups' claims of inventing the cotton gin. The patent examiner group will decide who should get credit for the invention.

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Lesson 3 - Steps of Cotton Production

Put the steps of cotton production in the correct order by placing the number in the cotton boll.

At the gin, rollers with sharp teeth pull the lint (the long fibers) from the seed.

The cotton boll dries out and cracks open, exposing the cotton fibers.

The thread is woven into cloth which is cut into lengths called bolts.

The bolts are cut into jeans, shirts, towels and many other items.

The cotton is harvested by a stripper harvester or a cotton picker.

The farmer plants the cotton and keeps the plants healthy and protects the growing plants from insects, weeds or diseases.

At the textile mill or manufacturing facility that is involved in some aspect of textile manufacturing, fibers are spun into cotton thread.

The cotton is then unloaded from the harvester into the boll buggy.

The cotton is loaded onto a truck loads to go to the cotton gin

The lint is cleaned and packed into bales.

From the boll buggy, the cotton is then transferred to a module builder that forms a new cotton module.

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Lesson 3 - Steps of Cotton Production Answers

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What Can You Make From a Bale of Cotton?

A bale of cotton weighs about 480 pounds. One bale of cotton can make 1,217 men's T-shirts of 313,600 $100 bills. Here are some things that are made from a bale of cotton.

Women's	
Hankerchiefs	21,960
Dresses	274
Jeans	249
Skirts	409
Mid-calf socks	4,321
Woven blouses	773
Sweaters	379
Night Gowns	780
Woven slacks	415
Shorts	733

Men's	
Hankerchiefs	8,347
Woven dress shirts	765
Woven sports shirts	906
Work shirts	543
Boxer shorts	2,104
Jockey shorts	2,419
Sleeveless undershirts	1,943
Work trousers	374
Dress & sport trousers	484
Work gloves	1,918
Mid-calf socks	3,557
Jeans	215

Home	
Diapers	3,085
Sheets	249
Pillow cases	1,256
Bath towels	690